

The Files: Contract No: 904, T.O. 3

27 August 1962

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Trip Report - Tri-Phase Modulator, AT-11



1. Project Description:

This task provides for the design and development of a High-Speed Tri-Phase Modulator for fixed station use. The unit will be designed to accept information in the form of standard teletype punched paper tape and provide a tri-phase signal output capable of driving any standard class "C" or other less efficient transmitters. The output will be between 2 and 8 mcs with an adjustable output level of up to 5 watts across a 50 ohm load. There will be six crystal controlled channels and one VFO input.

2. Contractual Information:

- a. Initial Cost: \$69,757.00
- b. Initiation Date: 1 June 1962
- c. Completion Date: 31 December 1962
- d. Deliverable Items: Two Engineering Models

3. Date of Meeting: 1 August 1962

4. Place of Meeting:



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5. Persons Attending:

Agency

Non-Agency

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6. Contractor's Performance:

- a. On Schedule and Expected to Remain So: Yes
- b. Within Obligated Funds and Expected to Remain So: Yes
- c. Satisfactory Technical Progress: Yes

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7. Project Status:

The contractor has completed the preliminary design on the RF section of the AT-11 and has started tests on individual circuits. IE: RF driver, RF power amplifier, and crystal oscillator, and the EI and IF, 18 mc balanced modulator and phase shifting network for the tri-phase modulator section. The contractor has surveyed the market for tape readers and has tentatively decided on a Ferranti model, 196D, unless a new Sorban tape reader, which according to claims can read chaffless tape, is found to be satisfactory for use in the AT-11.

We discussed in more detail the human engineering of the AT-11 system. The items included the following:

A. Protection for the power amplifier stage to prevent damage due to either a short or open output transmission line.

B. Provide RF input and output level adjustments for the modulator with meters to allow adjustment of the input and output to the desired setting.

C. Since tripping in a transmitter will cancel the tri-phase signal, it is necessary to provide assistance to the operator in the modulator output frequency selection so that it corresponds to doubling, quadrupling or octupling in the transmitter. The method selected for band switching will be a 7 position switch with the following positions:

Frequency - MC/S		
<u>Position</u>	<u>Modulator Output</u>	<u>Transmitter Output</u>
1	2.0 - 3.99	2.0 - 3.99
2	2.0 - 3.99	4.0 - 7.99
3	2.0 - 3.99	8.0 - 15.99
4	2.0 - 3.99	16.0 - 31.99
5	4.0 - 7.99	4.0 - 7.99
6	4.0 - 7.99	8.0 - 15.99
7	4.0 - 7.99	16.0 - 31.99

It should be noted in the above, that when the modulator output is set to the proper position, the transmitted output frequency is also indicated which should assist the operator in setting up the transmitter.

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- D. The operating temperature range of the equipment will be 0°C to +50°C.
- E. The input power source required will be 103 to 126 volts AC, 50-60 cycle.
- F. BNC type connectors will be used for WFO input and modulator output.
- G. Six crystal positions using PT-243 crystal sockets with individual trimmers and a correlation capability of 3E mhz will be used in circuit design.
- H. Recognition codes will be selectable from the front channel and a list of at least ten address codes with good correlation and poor cross correlation properties will be selected to facilitate system testing.

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